

# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN OR RELATING TO VENTILATION HOODS OR COWLS

(71) We, GEBR. MAYER K.G., of Neheim-Huesten, Germany (Fed. Rep.); a Germany company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a kitchen ventilation cowl or hood having a filter. Such ventilation hoods or cowls may be disposed above kitchen stoves and serve to remove the fumes and smells resulting from boiling and roasting. A distinction may be made between ventilation hoods or cowls operating on the exhaust air and on the re-circulating air principle. For the purposes of definition it may be stated that, whilst the exhaust air type discharges the kitchen air, after it has been sucked through a filter by a ventilation fan and freed of suspended substances, into the outside atmosphere through an air discharge passage, the re-circulating type extracts air from the kitchen, passes it through a filter system which rids it both of suspended substances and also of smells, and returns the filtered air to the kitchen.

Such methods of operation involve the use of filters or filter systems which on continuous use become progressively clogged with foreign substances and thus increasingly lose their efficiency. Consequently, the filter elements have to be cleaned or replaced from time to time. Here the difficulty occurs that the particular degree of blockage of a filter cannot be perceived directly from the outside, and only indirectly by the reduction in the removal of odours. In view of this, the time for replacing the filter system cannot be precisely determined.

The object of the present invention is to produce a hood or cowl device which gives a signal when the blockage of the filter becomes too great.

According to the present invention there is provided a kitchen ventilation hood or cowl operating on the exhaust air or on the re-circulating air principle (as hereinbefore

defined), having a filter, a fan downstream of the filter, a bypass valve comprising a diaphragm, one side of which diaphragm is subjected to the air pressure downstream of the filter, and an alarm or warning means, the valve being operable to open when there is a pressure reduction downstream of the filter due to the said filter being blocked, and opening of the valve allowing air to bypass the filter and operating the alarm or warning means.

With such an arrangement it is possible for the device to operate normally as long as the filter has sufficient absorptive capacity and is not badly clogged. Only when the filter has become substantially blocked by suspended substances does a partial vacuum occur ahead of the fan in the ventilation hood or cowl, which causes the valve to open and trigger the signal.

In a preferred embodiment of the present invention the valve is secured, together with the filter and fan, to a pivotable front plate of the hood or cowl and can pivot with this plate. Due to this arrangement, the front plate of the ventilation hood can be swung out of a vertical position, which it normally occupies, into a position directly above the more frequently used front cooking points of a kitchen stove below the hood, a feature which was usually not provided in conventional constructions.

When the front plate of the hood is so pivoted, a baffle plate, pivoted at the lower edge of a rear wall of the ventilation cowl, swings forward into a position of use in which it closes the gap resulting from the pivoting of the front plate. This baffle plate may be provided with a lamp which is automatically switched on when the baffle plate swings forward and which illuminates the surface of the stove below it.

In the accompanying drawings,

Figure 1 shows a cross-section of a ventilation hood or cowl operating on the re-circulating air principle;

Figures 2 and 3 show, in a side view section, a ventilation cowl operating on the

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exhaust air principle, arranged above the cooking points of a kitchen stove, in a normal condition and in a tilted position respectively.

- 5 Although not illustrated the cowl of Figures 2 and 3 has a valve and alarm as in the cowl of Figure 1.

From Figure 1, it is apparent that the vapours and fumes of a kitchen stove rising from below the device are conveyed into an exhaust passage 4 by an exhaust fan 1 in the ventilation cowl after traversing a suspended substance or dust filter layer 2 and a layer 3 of an absorbent substance, such as activated carbon. The exhaust passage 4, as shown, communicates at a suitable point with the kitchen space again, but in the exhaust air method, it would communicate with a ventilation flue leading into the outer atmosphere. A valve 5 is inserted in a wall of the ventilation cowl in the space between the filter system 2/3 and the fan 1. This valve opens under a predetermined pressure reduction and connects the space between the fan 1 and the filter system 2/3 directly with the kitchen space. This happens when the two layers 2, 3, of the filter system are clogged with foreign substances to such an extent that they are no longer capable of functioning, and must be cleaned or replaced. For this purpose, valve 5 normally closes an opening in the wall of the housing near the suction opening from the inside, by means of a diaphragm disc, this opening being uncovered against the force of a spring when there is a partial vacuum in the housing. The displacement of the associated valve spindle closes an electric contact which in turn closes a signal circuit that indicates optically and/or acoustically that the filter layers need renewing.

Figures 2 and 3 show a cowl having a front plate 6 which, in the normal condition of the ventilation cowl, acts as a vertical wall of a kitchen wall fitting without being any more conspicuous than other wall cabinets. This front plate 6, together with means mounted on its back surface, can be swung forward, the cowl inlet becoming disposed mainly over existing cooking points, and in particular over the front ones of a stove. In this position a baffle plate mounted

on the rear wall of the ventilation cowl, swings forward and covers the resultant gap. If required, a lamp provided on the baffle plate 7, can be switched on when the baffle plate swings forward. Upon conclusion of the cooking process, the front plate of the ventilation cowl can be returned to its vertical position (Figure 1), the baffle plate 7 being pushed backwards.

#### WHAT WE CLAIM IS:—

1. A kitchen ventilation hood or cowl operating on the exhaust air or on the recirculating air principle (as hereinbefore defined), having a filter, a fan downstream of the filter, a bypass valve comprising a diaphragm, one side of which diaphragm is subjected to the air pressure downstream of the filter, and an alarm or warning means, the valve being operable to open when there is a pressure reduction downstream of the filter due to the said filter being blocked, and opening of the valve allowing air to bypass the filter and operating the alarm or warning means. 65
2. A hood or cowl according to Claim 1, wherein the valve includes a spring loaded spindle which contacts an electrical contact for alarm or warning means operation when the valve is opened. 70
3. A hood or cowl according to Claim 1, wherein the valve is secured, together with the filter and fan, to a pivotable front plate of the hood or cowl and can pivot with this plate. 75
4. A hood or cowl according to Claim 3, wherein a rear wall of the hood or cowl is provided with a baffle plate which is mounted at its lower edge and is pivotable so that it covers a gap formed when the front plate of the hood or cowl is pivoted outwards with respect to the rear wall. 80
5. A hood or cowl according to Claim 4, wherein the baffle plate is provided with a lamp which is automatically switched on when the front plate is pivoted outwards. 85
6. A kitchen ventilation hood or cowl substantially as hereinbefore described, with reference to the accompanying drawings. 90

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